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WHAT IS CLAIMED IS:

1. A semiconductor device with a line structure formed on a semiconductor substrate,

wherein the line structure comprises:

a conductor layer formed on the semiconductor substrate;

a dielectric film formed on the conductor layer; and

a conductor line formed on the dielectric film, and

wherein the dielectric film comprises:

a first dielectric portion, at least part of the first dielectric portion being located between the lower surface of the conductor line and the upper surface of the conductor layer; and

second and third dielectric portions laterally arranged to interpose the first dielectric portion therebetween, and

wherein the dielectric constant of the first dielectric portion is different from at least one of the dielectric constants of the second and third dielectric portions.

2. The device of Claim 1, wherein the dielectric constant of the first dielectric portion is lower than those of the second and third dielectric portions.

3. The device of Claim 1 or 2, wherein at least one of the dielectric constants of the second and third dielectric portions is higher than 10.

4. The device of Claim 1 or 2, further comprising another dielectric film covering the conductor line.

5. The device of Claim 1 or 2, further comprising an active component operable at radio frequencies, the active component being formed on the semiconductor substrate and electrically connected to the line structure.

6. A semiconductor device with a line structure formed on a semiconductor substrate,

wherein the line structure comprises:

a conductor layer formed on the semiconductor substrate;

a dielectric film formed on the conductor layer; and

a conductor line formed on the dielectric film, and

wherein the dielectric film includes two or more dielectric layers with mutually different dielectric constants.

7. The device of Claim 6, wherein at least one of the two or more dielectric layers comprises:

a first dielectric portion, at least part of the first dielectric portion being located between the lower surface of the conductor line and the upper surface of the conductor layer; and

second and third dielectric portions laterally arranged to interpose the first dielectric portion therebetween, and

wherein the dielectric constant of the first dielectric portion is different from at least one of the dielectric constants of the second and third dielectric portions.

8. The device of Claim 6, wherein at least one of the two or more dielectric layers has been patterned.

9. A semiconductor device with a line structure formed on a semiconductor substrate,

wherein the line structure comprises:

a conductor layer formed on the semiconductor substrate;

a first dielectric film formed on the conductor layer;

a conductor line formed on the first dielectric film;

and

a second dielectric film covering the conductor line.

10. The device of Claim 9, wherein the first dielectric film includes two or more dielectric layers with mutually different dielectric constants.

11. A semiconductor device with a line structure formed on a semiconductor substrate,

wherein the line structure comprises:

a conductor layer formed on the semiconductor substrate;

a dielectric film formed on the conductor layer; and

a conductor line formed on the dielectric film, and
wherein a region of the conductor layer, which is located
under the conductor line, has been removed at least partially.

12. The device of Claim 11, wherein the dielectric film
includes two or more dielectric layers with mutually different
dielectric constants.

13. The device of Claim 11 or 12, further comprising a
second dielectric film covering the conductor line.

14. The device of Claim 13, wherein the dielectric con-
stant of the second dielectric film is higher than 10.

15. The device of Claim 11 or 12, further comprising an
active component operable at radio frequencies, the active
component being formed on the semiconductor substrate and
electrically connected to the line structure.

16. A semiconductor device with a line structure formed
on a semiconductor substrate,

wherein the line structure comprises:

a coplanar conductor layer formed over the semiconductor
substrate; and

a dielectric film formed on the coplanar conductor

layer,

wherein the coplanar conductor layer includes: a grounded conductor layer; and a conductor line spaced apart from the grounded conductor layer, and

wherein the dielectric constant of the dielectric film is higher than 10.

17. The device of Claim 16, wherein a dielectric with a dielectric constant equal to or smaller than 10 exists between the grounded conductor layer and the conductor line.

18. The device of Claim 16 or 17, further comprising an active component operable at radio frequencies, the active component being formed on the semiconductor substrate and electrically connected to the line structure.

19. A semiconductor device with a line structure formed on a semiconductor substrate,

wherein the line structure comprises:

a first dielectric film formed on the semiconductor substrate;

a coplanar conductor layer formed on the first dielectric film; and

a second dielectric film formed on the coplanar conductor layer.

20. The device of Claim 19, wherein the dielectric constant of at least one of the first and second dielectric films is higher than 10.

21. The device of Claim 20, wherein the first dielectric film includes two or more dielectric layers with mutually different dielectric constants.

22. The device of Claim 19, 20 or 21, further comprising an active component operable at radio frequencies, the active component being formed on the semiconductor substrate and electrically connected to the line structure.

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